

Issued

by the

SMITHSONIAN INSTITUTION
U. S. NATIONAL MUSEUM

Vol. 105

Washington: 1955

No. 3353

BITING LICE OF THE GENUS SAEMUNDSSONIA
(MALLOPHAGA: PHILOPTERIDAE) OCCURRING ON TERNSBy RONALD A. WARD¹

Recently Clay (1949) contributed to the elucidation of the systematics of the species of the genus *Saemundssonia* occurring on terns. The present study undertakes to further amplify our knowledge of this group by a restudy of Kellogg's specimens and the examination of additional unstudied material. In it the known species are redescribed where necessary, *Saemundssonia brevicornis* (Giebel) is removed from synonymy and is considered as a distinct species, and two new species are described—*S. parvigenitalis* from *Sterna forsteri* Nuttall, and *S. petersi* from *Sterna f. fuscata* Linné.

I am indebted to the following people and institutions for the loan of specimens (the abbreviations following the names are used throughout the paper to indicate where the material is deposited): Dr. G. F. Ferris, Stanford Natural History Museum (SNHM); Dr. Henry Dietrich, Department of Entomology, Cornell University (CU); Dr. E. A. Chapin, U. S. National Museum (USNM); Harold S. Peters, U. S. Fish and Wildlife Service, Atlanta, Ga. (HSP); Dr. E. H. Bryan, Jr., Bernice P. Bishop Museum (BPBM); Dr. C. H. Curran, American Museum of Natural History (AMNH); Rupert Wenzel, Chicago Natural History Museum (CNHM); and Richard B. Fischer, Department of Ornithology, Cornell University. For advice on certain nomenclatorial problems, I wish to thank Dr. A. E. Emerson of the University of Chicago and Mr. R. L. Araujo of the Instituto Biológico, São Paulo, Brazil.

On the basis of the male genitalia, three main groups of species of *Saemundssonia* may be considered. One group, consisting of *S. meridiana*, *S. petersi*, and *S. snyderi*, has genitalia resembling those found on the gulls; another group, *S. lobaticeps* and *S. hopkinsi*, has

¹ Department of Biology, Gonzaga University, Spokane, Wash.

the basal plate with a distal sclerotized crossbar and median fusion of the endomeral projections as in *S. cephalosus* (Denny). The remaining species, exemplified by *S. sterna*, form a group that seems to have very little in common with the remaining members of the genus, and seem to be the only group that has shown extensive speciation among the terns.

The differences between many of the species are minute, and often can only be expressed in quantitative terms. An example of this is shown by the separation of the males of *S. laticaudata* and *S. brevicornis*. All measurements and chaetotaxy counts, except for the width of the clypeal signature and the number of setae on the sixth abdominal tergite, do not show valid statistical differences when subjected to the "t" test. No attempt has been made to erect subspecies for species such as *S. petersi*, where a good series of specimens was available from three host subspecies, as no valid statistical differences could be obtained for any character or combinations of them.

Measurements of the type specimens are listed in table 5. Certain of the measurements prove to be diagnostic for the separation of species. These are summarized in tables 6 and 7.

In the key to species in Clay's paper, the symbols for "greater than" and "less than" were reversed and the name *vittata* was used in the female key instead of *lockleyi*. Corrections have been made in the keys below, and several additional species have been included.

Key to species of Saemundssonia

MALES

1. Basal plate with distal sclerotized crossbar	2
Basal plate without distal crossbar	3
2. Cephalic index less than 1.04; length of paramere less than 0.24 mm.	
lobaticeps (Giebel)	
Cephalic index greater than 1.05; length of paramere greater than 0.28 mm.	
hopkinsi Clay	
3. Endomere with terminal, strongly sclerotized, toothlike process.	
melanocephalus (Burmeister)	
Endomere with terminal, lightly sclerotized, evenly rounded process; or lacking one	4
4. Paramere less than 0.15 mm. in length	parvigenitalis new species
Paramere greater than 0.20 mm. in length	5
5. Linear arrangement of mesosomal setae (occasionally clustered on one side)	6
Clustered arrangement of setae on both halves of the mesomere	10
6. Inner face of paramere head with basad concavity (virtually forms a right angle with shaft)	7
Inner face of paramere head with slight basad convexity	9
7. Paramere greater than 0.33 mm. in length	meridiana Timmermann
Paramere less than 0.31 mm. in length	8

8. Paramere 0.28 to 0.30 mm. in length *snyderi* (Kellogg and Paine)
Paramere 0.22 to 0.26 mm. in length *petersi*, new species

9. Clypeal signature 0.16 to 0.18 mm. in width; 4 to 9 setae on margin of abdominal sternite VI *laticaudata* (Rudow)
Clypeal signature 0.14 to 0.16 mm. in width; 2 to 5 setae on margin of abdominal sternite VI *brevicornis* (Giebel)

10. Details of endomere and paramere head as in illustrations by Clay (1949, figs. 16, 22, 23) *sternae* (Linné)
Details of endomere and paramere head as in illustrations by Clay (1949, figs. 17, 24, 25) *lockleyi* Clay

FEMALES

1. Hyaline anterior margin of head medianly emarginate 2
Hyaline anterior margin of head not emarginate 3

2. Width at temples usually less than 0.72 mm.; setae lateral to last abdominal sternite, 5 to 7 in number *lobaticeps* (Giebel)
Width at temples usually greater than 0.73 mm., setae lateral to last abdominal sternite 3 (occasionally 4) in number *hopkinsi* Clay

3. Thoracic sternal plate with 2 setae on both the anterior and posterior margins 4
Thoracic sternal plate with setae only on posterior margin 5

4. Cephalic index less than 1.03; length of abdominal sternite VII (at midline) greater than 0.08 mm *snyderi* (Kellogg and Paine)
Cephalic index greater than 1.03; length of abdominal sternite VII (at midline) 0.06 to 0.08 mm *meridiana* Timmermann

5. Sternite VII with posterolateral angles free or partially fused to subgenital plate *sternae* (Linné), *lockleyi* Clay,
brevicornis (Giebel), and *petersi*, new species
Sternite VII with posterolateral angles fused to subgenital plate 6

6. Width at temples greater than 0.63 mm *laticaudata* (Rudlow)
Width at temples less than 0.62 mm 7

7. Width at temples 0.52 to 0.59 mm.; width of clypeal signature 0.12 to 0.14 mm *melanocephalus* (Burmeister)
Width at temples 0.58 to 0.61 mm.; width of clypeal signature 0.14 to 0.18 mm *parvigenitalis*, new species

Saemundssonia sternae (Linné)

Pediculus sternae Linné, 1758, p. 616. Hosts: "Habitat in Sternis, Laris." = *Sterna h. hirundo* Linné.

Nirmus fornicatus Olfers, 1816, p. 89. Hosts: "Hab. in laris et sternis."

Docophorus 5-maculatus Piaget, 1885, p. 9. Host: *Hirundo urbica* (error) = *Sterna hirundo* Linné.

Docophorus melanocephalus Kellogg and Chapman, 1902, p. 20 [nec Burmeister].
Host: *S. forsteri* (error) = ? *S. h. hirundo* Linné.

Philopterus melanocephalus Peters, 1928, p. 225; 1936, p. 17 (part) [nec Burmeister]. Host: *S. h. hirundo* Linné.

Saemundssonia sternae (Linné), Clay, 1949, p. 4, figs. 1-6, 16, 22, 23. Hosts: *S. h. hirundo* Linné and *Gelochelidon n. nilotica* (Gmelin).

This species has been adequately characterized by Clay. Material studied from two forms of the Sterninae not available to her seem also to fall within the range of this species. Specimens from *Sterna*

d. dougalli Montagu and *Gelochelidon nilotica aranea* (Wilson) show a distribution of setae within that of material from the type host, with the exception of tergite VI of the male which has between 4 to 8 setae in contrast to the 8 to 10 listed by Clay. However, an examination of a few of the neoparatypes shows that some of the specimens have as low as 6 setae on this segment, and American specimens from the type host have as few as 5 setae on tergite VI. As far as measurements are concerned, the material studied is similar to *sternae*, with the exception of head width measurements on males from *Gelochelidon*, which have a slightly wider range at the high end. Unfortunately, insufficient material is available to determine if these differences are real or not. On host material identified as *Sterna forsteri* Nuttall specimens have been found that fit *sternae* perfectly and also fit a new species, *parvigenitalis*. In a brief study of some ornithological literature, it has been noticed that *Sterna forsteri* has often been confused with *S. hirundo*. This may explain the apparent occurrence of two species of *Saemundsson* on a single host species.

MATERIAL EXAMINED: 3♂♂ and 1♀ (neoparatypes) ex *Sterna h. hirundo* Linné, Great Britain, Kent (AMNH); 3♂♂ and 2♀♀ ex above host, Virginia, Cobbs Island, H. S. Peters, coll. (HSP); 1♂ and 5♀♀ ex above host, Ohio, Buckeye Lake, M. B. Trautman, coll. (HSP); 4♂♂ and 1♀ ex roseate tern (*S. d. dougalli* Montagu), British West Indies, Caicos Islands, Fort George Cay, H. S. Peters, coll. (USNM, Bishopp No. 15155); 1♂ and 1♀ ex gull-billed tern (*Gelochelidon nilotica aranea* (Wilson)), British West Indies, Bahama Islands, Fortune Island, H. S. Peters, coll. (USNM, Bishopp No. 15100); 1♂ and 1♀ ex above host, British West Indies, Caicos Islands, Fort George Cay, H. S. Peters, coll. (USNM, Bishopp No. 15154); 2♂♂ and 3♀♀ ex above host, British West Indies, Grand Caicos Island, H. S. Peters, coll. (USNM, Bishopp No. 15164); 1♂ ex *Sterna forsteri* Nuttall (error)=*S. h. hirundo* Linné, Louisiana, Grand Bayou (CU); 1♂ and 1♀, host as above, Minnesota, Leech Lake (SNHM, Kellogg No. 689a); 1♂ and 1♀, host as above, Georgia, Savannah, I. R. Tompkins, coll. (CU).

Saemundsson *lockleyi* Clay

Saemundsson *lockleyi* Clay, 1949, p. 11, figs. 17, 24, 25. Type host: *Sterna vittata georgiae* Reichenow; also recorded from *S. v. bethunei* Buller and *S. paradisaea* Pontopiddan.

As previously, no emendations are necessary to the original description.

MATERIAL EXAMINED: 2♂♂ and 3♀♀ ex *Sterna paradisaea* Pontopiddan, Alaska, Salmon Creek, R. B. Williams, coll. (det. T. Clay)

(USNM); 2♂♂ and 3♀♀ ex above host, Labrador, Turnerick, J. L. Austin, Jr., coll. (HSP); 2♂♂ and 2♀♀ ex *S. vittata bethunei* Buller, Campbell Island (det. T. Clay) (AMNH).

***Saemundssonia melanocephalus* (Burmeister)**

(*Docophorus melanocephalus* Nitzsch, 1818, p. 290, nomen nudem.)

Docophorus melanocephalus Burmeister, 1838, p. 426. Hosts: "Auf mehrern *Sterna* und *Larus* Arten."

Nirmus melanocephalus Giebel, 1861, p. 315. Host: *Sterna minuta*=*S. a. albifrons* Pallas.

Philopterus melanocephalus Peters, 1936, p. 17 (part) [nec Burmeister]. Host: *S. antillarum antillarum* (Lesson)=*S. albifrons antillarum* (Lesson).

Saemundssonia melanocephalus (Burmeister), Clay, 1949, p. 11, figs. 8, 11, 19, 28, 29. Host: *S. a. albifrons* Pallas.

A series of *Saemundssonia* from the least tern has been compared with a pair of neoparatypes. No differences may be ascertained, except for a slightly smaller head width in two of the females.

MATERIAL EXAMINED: 1♂ and 1♀ (neoparatypes) ex *Sterna a. albifrons* Pallas (AMNH); 2♀♀, South Carolina, Charleston, E. B. Chamberlain, coll. (USNM, Bishop No. 19900); 3♂♂ and 7♀♀, above locality, H. S. Peters, coll. (HSP, Bishop No. 20971); 1♀, Cuba, Isle of Pines, H. S. Peters, coll. (USNM, Bishop No. 15469); 1♂ and 1♀, British West Indies, Bahama Islands, Acklin Island, H. S. Peters, coll. (USNM, Bishop No. 15090); 1♂ and 3♀♀, British West Indies, Grand Caicos Island, H. S. Peters, coll. (USNM, Bishop No. 15168).

The above lots, except for the type material, are all from least terns (*Sterna albifrons antillarum* (Lesson)).

***Saemundssonia parvigenitalis*, new species**

Philopterus melanocephalus Peters, 1936, p. 17 (part) nec Burmeister. Host: *Sterna forsteri* Nuttall.

MALE: Head width is similar to that of *melanocephalus*. Chaetotaxy as in *sternae*, with exception of tergite V, which has 8 to 10 setae. Parameres differ in shape from those hitherto reported from the Sterninae (fig. 1,*a*) and are markedly smaller in length (0.10 to 0.13 mm.). Endomeres as in figure 1,*h*, with a basal, median fusion. Mesosomal setae apparently absent (fig. 1,*i*).

FEMALE: May be distinguished from *melanocephalus* by the slightly greater width of the head (0.59 to 0.62 mm.) and clypeal signature (0.14 to 0.18 mm.). Thoracic sternal plate with two setae on posterior margin. Abdominal chaetotaxy as in *sternae*. Sternite VII has the posterolateral angles fused to the subgenital plate. There are three to four setae present on each side of the last sternal plate.

TYPE MATERIAL: USNM 62279, 1♂ (holotype), 1♀ (allotype), and 1♂ (paratype with damaged parameres) ex Forster's tern (*Sterna forsteri* Nuttall), Louisiana, Northshores, F. M. Carroll, coll. (USNM, Bishop No. 30439).

Paratypes as follows, all from the type host: 2♂♂ and 1♀, Virginia, Wachapreague, M. B. Trautman, coll. (HSP); 1♂ and 1♀, South Carolina, Georgetown, H. S. Peters, coll. (HSP); 1♂ and 3♀♀, Florida, Pinellas County, W. G. Fargo, coll. (USNM, Bishop No. 15604); 5♀♀, Florida, Pass-a-Grille, W. G. Fargo, coll. (USNM, Bishop No. 15605); 1♂, Louisiana, Grand Bayou (CU); 1♂ (damaged) and 1♀, New York, Long Island, Orient (CU).

Saemundssonia laticaudata (Rudow)

Docophorus laticaudatus Rudow, 1869, p. 12. Host: *Sterna cantiaca* = *Thalasseus s. sandvicensis* (Latham).

Docophorus melanocephalus Kellogg, 1896, p. 99, pl. 4, fig. 6 (part) [nec Burmeister]. Host: *Sterna maxima* = *Thalasseus m. maximus* (Boddaert).

Philopterus melanocephalus Peters, 1936, p. 17 (part) [nec Burmeister]. Host: *Thalasseus m. maximus* (Boddaert).

Saemundssonia laticaudata (Rudow), Clay, 1949, p. 14, figs. 7, 18, 26, 27. Hosts: *T. s. sandvicensis* (Latham), *T. bengalensis par* (Mathews and Iredale), *T. bergi velox* (Cretzschmar), *T. b. bergi* (Lichtenstein), *T. m. maximus* (Boddaert), and *T. eurygnatha* (Saunders).

Thirty specimens have been studied from *Thalasseus m. maximus* (Boddaert), and cannot be separated by any criteria from the material described by Clay. However, material from *T. sandvicensis acutiflavidus* (Cabot) proves to be distinct from that on *T. s. sandvicensis* (Latham), and is redescribed as the species next discussed, *S. brevicornis* (Giebel).

MATERIAL EXAMINED: 1♂ and 1♀ ex *Thalasseus bergi velox* (Cretzschmar), Red Sea (T. Clay, det.) (AMNH); 1♀ ex *T. bergi cristatus* (Stephens), Solomon Islands, Guadalcanal, W. J. Beecher, coll. (CNHM).

The following lots are all from the royal tern (*T. m. maximus* (Boddaert)): 4♂♂ and 4♀♀, Georgia, Isle of Hope, I. R. Tompkins, coll. (USNM, Bishop No. 19614); 1♂ and 2♀♀, South Carolina, Cape Island, G. R. Lunz, Jr., coll. (USNM and HSP, Bishop Nos. 20413 and 20419); 1♂ and 1♀, Louisiana, New Orleans, F. M. Carroll, coll. (USNM, Bishop No. 20378); 1♀, Florida, Pass-a-Grille, W. G. Fargo, coll. (USNM, Bishop No. 8247); 3♀♀, Florida, 5 miles west of Clearwater, R. B. Fischer, coll.; 1♂ and 13♀♀, California, Pacific Grove (SNHM, Kellogg Nos. 53a and 2060); 5♂♂ and 2♀♀, California, Bay of Monterey (SNHM, Kellogg No. 50, and CU, Kellogg No. 65).

Saemundssonia brevicornis (Giebel)

Docophorus brevicornis Giebel, 1874, p. 112. Host: *Sterna acuflavida* = *Thalasseus sandvicensis acuflavidus* (Cabot).

MALE: This may be separated from *laticaudata* by the lesser width of the clypeal signature (0.14 to 0.16 mm.) and also by the lower number of setae (2 to 5) on the sixth abdominal tergite. Slight differences exist in chaetotaxy between this species and *laticaudata* (ex *T. m. maximus*) as shown in table 1.

FEMALE: Similar to *laticaudata*, except for the feature (in all specimens examined) of the separation of sternite VII from the subgenital plate. Three setae on each side of the last sternite. Abdominal chaetotaxy as in *sternae* (Clay, 1949, p. 10, table 1).

Neotypes are erected for this species, as Giebel's type in Germany was destroyed during World War II.

TABLE 1.—*Dorsal chaetotaxy of Saemundssonia brevicornis and S. laticaudata*

	<i>S. brevicornis</i>	<i>S. laticaudata</i>
Pterothorax	15-18	16-19
Abdomen II	2- 4	4- 6
“ III	6- 9	7- 9
“ IV	8-12	10-12
“ V	5-10	8-11
“ VI	2- 5	6- 9
“ VII	4	4- 7

TYPE MATERIAL: Neotype ♂ (the specimen with genitalia contained within the abdomen) and neallotype ♀ (to the left of the neotype as viewed through the microscope) ex Cabot tern (*Thalasseus sandvicensis acuflavidus* (Cabot)), British West Indies, Ragged Islands (Bishopp No. 15031). Neoparatypes as follows: The remaining single ♂ and ♀ on the above slide; 3♂♂ and 3♀♀, British West Indies, Turks Islands, Sand Cay (Bishopp No. 15207); 2♂♂ and 3♀♀, British West Indies, Little Inagua Island (Bishopp No. 15247); 1♂ and 2♀♀, British West Indies, Bahama Islands, Ragged Island, South Channel Cay (Bishopp No. 15042); 1♂, Cuba, Rum Cayo (Bishopp No. 15460). All the above specimens were collected by H. S. Peters and are deposited in the U. S. National Museum.

Saemundssonia meridiana Timmermann

Philopterus melanocephalus Peters, 1936, p. 17 (part) [nec Burmeister]. Host: *Sterna anaethetus melanoptera* Swainson.

Saemundssonia meridiana Timmermann, 1950, p. 1, fig. 1. Host: *S. anaethetus melanoptera* Swainson.

MALE: This species may be readily recognized by its head width and elongate parameres; both of which are greater than those of any other species found on terns. Mesosomal structures as in figure 1,e.

One striking feature of this species is that both sexes have a pair of both anterior and posterior setae on the thoracic sternal plate. Dorsal chaetotaxy as in *S. petersi*.

FEMALE: As in the male, this species is characterized by its greater size. Dorsal chaetotaxy as in table 3. Sternite VII is free from the subgenital plate. There are 3 to 4 setae on each side of the last sternal plate.

MATERIAL EXAMINED: All specimens ex bridled tern (*Sterna anaethetus melanoptera* Swainson). 1 ♂ and 1 ♀, British West Indies, Bahama Islands, North Elbow Cay, Cay Sal Bank, H. S. Peters, coll. (USNM, Bishop No. 15014); 2 ♂♂ and 1 ♀, British West Indies, Turks Island, Long Cay, H. S. Peters, coll. (HSP, Bishop No. 15205); 2 ♂♂, South Carolina, Orangeburg, E. B. Chamberlain, coll. (USNM, Bishop No. 19713); 1 ♂ and 1 ♀, New York, Long Island, L. Wilcox, coll. (USNM); 2 ♀♀, Alabama, Fairhope, Mrs. W. H. Edwards, coll. (USNM, Bishop No. 19680).

Saemundssonia petersi, new species

Docophorus melanocephalus Kellogg and Kuwana, 1902, p. 462 (part) [nec Burmeister]. Hosts: *Sterna fuliginosa* = *S. fuscata crissalis* (Lawrence) and *Nesomimus macdonaldi* Ridgway (straggler).

Docophorus melanocephalus Kellogg, 1906, p. 316 (part) [nec Burmeister]. Hosts: *Sterna fuliginosa* = *S. fuscata crissalis* (Lawrence) and *Anous stolidus galapagensis* Sharpe (straggler).

Philopterus snyderi Ferris, 1932, p. 71, fig. 20 [nec Kellogg and Paine]. Host: *Sterna fuscata oahuensis* Bloxham.

Saemundssonia snyderi Thompson, 1948, p. 199 (part) [nec Kellogg and Paine]. Host: *S. fuscata oahuensis* Bloxham.

This species has had a confusing nomenclatorial history for 50 years. The types of *Saemundssonia peristicta* (Kellogg and Kuwana) have been examined, and compared with material from *Sterna fuscata* Linné. It is clearly evident that *peristicta* is not the species of *Saemundssonia* found on *Sterna fuscata* as Clay (1949, p. 15) assumes. The status of *Saemundssonia peristicta* (Kellogg and Kuwana) is discussed by the author in another paper (Ward, 1953).

Specimens have been studied from two subspecies of *S. fuscata* other than the nominate host. No valid statistical differences have been found in comparing measurements or chaetotaxy counts for the separation of subspecies.

MALE: Closely allied to *meridiana* and *snyderi*. Head not as wide as in *meridiana*. Dorsal chaetotaxy as in table 2. Genitalia as in figure 1, b, d, f. Parameres 0.22 to 0.26 mm. in length; with a basad concavity on the inner face, forming almost a right angle with the shaft as in *meridiana* and *snyderi*. Endomere with a terminal, lightly sclerotized, evenly rounded process. Mesosomal setae linearly arranged on at least one side.

FEMALE: Sternite VII free or partially fused to subgenital plate. May not be reliably separated from *sternae*, *lockleyi*, or *brevicornis*.

TABLE 2.—*Dorsal chaetotaxy of Saemundssonia petersi, new species. (Specimens from Sterna fuscata crissalis, S. f. oahuensis, and S. f. fuscata are included.)*

	Male	Female
Pterothorax	13-17	14-17
Abdomen II	2-4	2-3
“ III	7-10	7-10
“ IV	8-13	10-12
“ V	9-12	10-13
“ VI	4-7	6-12
“ VII	4	6-10

TYPE MATERIAL: All specimens in the type series are from the sooty tern (*Sterna f. fuscata* Linné). 1♂ (holotype, USNM 62280) and 1♀ (allotype), Bahama Islands, North Elbow Cay, Cay Sal Bank, H. S. Peters, coll. (USNM, Bishop No. 15009). Paratypes as follows: 2♂♂ and 2♀♀, above locality and coll. (USNM, Bishop Nos. 15009-10); 12♂♂ and 11♀♀, British West Indies, Caicos Islands, Six Hills Cay, H. S. Peters, coll. (USNM, Bishop Nos. 15211-12, 15221); 1♀, Virgin Islands, St. Thomas (CNHM).

OTHER MATERIAL EXAMINED: 1♀ ex *Sterna fuscata oahuensis* Bloxham, Hawaii, Moku Manu, off Oahu, L. Kartman, coll. (USNM); 1♂ and 1♀ ex above host, Laysan Island, Tangier Exped., coll. (BPBM). 1♂ and 1♀ ex *Sterna fuliginosa* (= *S. fuscata crissalis* (Lawrence)), Clipperton Island (SNHM, Kellogg No. 1060b); 1♂ ex *Nesominus macdonaldi* (error) (= *S. fuscata crissalis*), Galápagos Islands, Gardner Island (SNHM, Kellogg No. 991); 1♂ ex *S. fuliginosa* (= *S. fuscata crissalis*), Lat. 1° N., Long. 93° W., R. Beck, coll. (SNHM, Kellogg No. 1463c); 1♂ ex *Solpinctes guadalupensis* (error) (= *Sterna fuscata crissalis*), Guadalupe Island (SNHM, Kellogg No. 1083b); 2♂♂ and 3♀♀ ex *Anous stolidus galapagensis* (error) (= *Sterna fuscata crissalis*), Galápagos Islands, off Culpepper Island, R. Beck, coll. (SNHM, Kellogg No. 1438a); 1♂ and 2♀♀ ex *Anous stolidus* (error) (= *Sterna fuscata crissalis*), R. Beck, coll. (SNHM, Kellogg No. 1484b).

This species is named in honor of H. S. Peters, who has carefully collected and mounted many of the specimens studied in this paper.

Saemundssonia snyderi (Kellogg and Paine)

Decophorus snyderi Kellogg and Paine, 1910, p. 124, figs. 1, 2. Host: *Sterna lunata* Peale.

Saemundssonia snyderi (Kellogg and Paine), Thompson, 1948, p. 199 (part). Host: *Sterna lunata* Peale.

MALE: Head width is similar to that of *petersi*. Dorsal chaetotaxy also as in *petersi*. As in *meridiana*, the thoracic sternal plate has both anterior and posterior setae in both sexes. In some cases, however, only one anterior and two posterior setae are present. Gen-

italia as in figure 1, *c, g*. The parameres are intermediate in length between those of *petersi* and *meridiana* (0.28 to 0.30 mm.). The mesosomal setae are linearly arranged on at least one side.

FEMALE: Dorsal chaetotaxy as in table 3. Sternite VII is free from the subgenital plate and is slightly longer at the midline than in *meridiana*.

TABLE 3.—*Dorsal chaetotaxy of Saemundssonia meridiana and S. snyderi.*

	♀ <i>meridiana</i>	♀ <i>snyderi</i>
Pterothorax	13-18	13-16
Abdomen II	4-7	2-6
“ III	8-12	10-12
“ IV	12-13	11-12
“ V	10-14	11-13
“ VI	11-13	9-13
“ VII	10-13	9-11

In the original description, no specimens were designated as types. A male specimen (the only intact individual containing the genitalia within the abdomen) is designated as lectotype. The remaining 2♂♂ (one with genitalia dissected out, and the other with extruded genitalia) and 3♀♀ are designated as paralectotypes.

MATERIAL EXAMINED: 3♂♂ and 3♀♀ ex *Sterna lunata* Peale, Laysan Island, J. D. Snyder, coll. (labeled "Type") (SNHM, Kellogg No. 1324); 1♀ ex above host and locality, *Tanager* Exped., coll. (BPBM).

Saemundssonia lobaticeps (Giebel)

Docophorus lobaticeps Giebel, 1874, p. 109. Hosts: *Sterna hirundo* and *S. fissipes* = *Chlidonias n. nigra* (Linné).

Docophorus pustuliferus Picaglia, 1885, p. 84. Host: *Hydrochelidon surinamensis* = *Chlidonias nigra surinamensis* (Gmelin).

Philopterus melanocephalus Peters, 1928, p. 225; 1936, p. 17 (part) [nec Burmeister]. Host: *Sterna hirundo* Linné (straggler) = *Chlidonias nigra surinamensis* (Gmelin).

Saemundssonia lobaticeps (Giebel), Clay, 1949, p. 15, figs. 9, 12, 14, 20, 30, 31. Hosts: *Chlidonias nigra nigra* (Linné) (type host); also, *C. h. hybrida* (Pallas), *C. hybrida indica* (Stephens), and *C. leucoptera* (Temminck).

Specimens have been seen from the type host of *pustuliferus*. Minute differences exist, such as in the head width and chaetotaxy (see table 4). However, these differences are of no significance. At the present time, it seems best to consider *pustuliferus* as a synonym of *lobaticeps*.

MATERIAL EXAMINED: 2♂♂ and 1♀ ex black tern (*Chlidonias nigra surinamensis* (Gmelin)), Minnesota, St. Anthony Park (USNM); 4♂♂ and 1♀ ex above host, Nebraska, Hackberry Lake, G. E. Hudson, coll. (CU); 1♂ and 1♀ ex *Sterna albifrons antillarum* (Lesson) (straggler from *Chlidonias nigra surinamensis*), Cuba, Isle of Pines,

H. S. Peters, coll. (USNM, Bishop No. 15469); 1♂ ex *Sterna h. hirundo* Linné (straggler from *Chlidonias nigra surinamensis*), Ohio, Sandusky, H. S. Peters, coll. (HSP); 2♂♂ ex *S. h. hirundo* (straggler

TABLE 4.—*Dorsal chaetotaxy of Saemundssonia lobaticeps (Giebel).*

	Male	Female
Pterothorax	15-20	17-21
Abdomen II	6-9	8
“ III	9-12	13
“ IV	10-14	10-15
“ V	8-14	11-15
“ VI	4-7	10-14
“ VII	4-9	9-10

from *Chlidonias nigra surinamensis*), South Carolina, Georgetown, H. S. Peters, coll. (HSP).

Saemundssonia hopkinsi Clay

Saemundssonia hopkinsi Clay, 1949, p. 18, figs. 10, 13, 15, 21. Host: *Sterna aurantia* Gray.

No new material referable to this species was observed during the present study.

MATERIAL EXAMINED: 1♂ (paratype), ex *Sterna aurantia* Gray, India, Deccan (T. Clay, det.) (AMNH).

TABLE 5.—*Measurements of types of species of Saemundssonia, in millimeters.*

	Male				Width			
	Length				A	B	C	D
	A	B	C	D				
Head	0.54	0.65	0.62	0.65	0.50	0.62	0.56	0.62
Signature					0.13	0.16	0.13	0.15
Prothorax	0.13	0.16	0.17	0.17	0.27	0.33	0.31	0.32
Pterothorax	0.18	0.21	0.24	0.21	0.37	0.46	0.40	0.44
Abdomen	0.63	0.88	0.66	0.84	0.62	0.73	0.66	0.71
Total	1.32	1.74	1.54	1.72				
Paramere	0.11	0.26	0.24	0.30				
Female								
	Length				Width			
	A	B	C	D	A	B	C	D
	0.60	0.71	0.65	0.67	0.59	0.68	0.64	0.69
Head					0.14	0.17	0.16	0.16
Signature								
Prothorax	0.15	0.18	0.16	0.18	0.31	0.37	0.33	0.36
Pterothorax	0.24	0.27	0.23	0.27	0.40	0.49	0.46	0.49
Abdomen	0.84	1.12	0.99	1.11	0.71	0.84	0.83	0.87
Total	1.66	2.06	1.84	2.06				
Sternite VII	0.10	0.11	0.07	0.09				
(midline)								

[Explanation: A, *parrigenitalis* (♂ holotype, ♀ allotype); B, *brericornis* (♂ neotype, ♀ neallotype); C, *petersi* (♂ holotype, ♀ allotype); D, *snyderi* (♂ lectotype, ♀ paralectotype)]

TABLE 6.—*Measurements of males in species of Saemundssonia (in mm. except for cephalic index).*

Species	Host	Signature width Mean	Head width Mean		Cephalic index Mean		Paramere length Mean	No. Speci- mens
			Range	Range	Range	Range		
sterna	<i>Sterna h. hirundo</i>	0.15	0.14-0.16	0.54	0.52-0.56	0.93	0.90-0.96	0.24
	<i>S. d. dougalli</i>	0.14	0.14-0.15	0.54	0.53-0.55	0.94	0.92-0.97	0.23
	<i>Gelochelidon nilotica aranea</i>	0.16	0.16	0.58	0.57-0.59	0.97	0.96-0.97	0.24
lockleyi	<i>S. paradisea</i>	0.15	0.14-0.17	0.54	0.51-0.56	0.91	0.89-0.93	0.24
	<i>S. vittata bethunei</i>	0.15	0.15	0.55	0.55-0.56	0.95	0.94-0.95	0.24
melanocephalus	<i>S. a. albifrons</i>	0.13		0.52		0.96		0.14
	<i>S. a. albifrons antillarum</i>	0.12	0.12-0.13	0.51	0.49-0.52	0.92	0.89-0.96	0.17
parvigenitalis	<i>S. forsteri</i>	0.14	0.13-0.15	0.51	0.49-0.53	0.92	0.85-0.94	0.11
laticaudata	<i>Thalasseus bergi velox</i>	0.16		0.62		0.94		0.27
	<i>T. m. maximus</i>	0.17	0.16-0.18	0.62	0.61-0.65	0.95	0.93-0.98	0.27
brevicornis	<i>T. sandvicensis acuiflavidus</i>	0.15	0.14-0.16	0.61	0.58-0.63	0.93	0.91-0.95	0.26
	<i>S. anaethetus melanoptera</i>	0.15	0.15-0.17	0.63	0.62-0.64	0.99	0.96-1.01	0.35
petersi	<i>S. f. fuscata</i>	0.15	0.13-0.16	0.58	0.55-0.59	0.93	0.90-0.93	0.24
	<i>S. fuscata crissalis</i>	0.14	0.14-0.15	0.59	0.56-0.60	0.94	0.91-0.96	0.25
	<i>S. f. oahuensis</i>	0.15	0.14-0.15	0.57	0.56-0.57	0.90	0.90	0.24

snyderi	<i>S. lunata</i>	0.15 0.15-0.16	0.61 0.57-0.62	0.96 0.94-0.98	0.29 0.28-0.30	3
lobaticeps	Chlidonias leucoptera	0.14 0.13	0.60 0.56	1.00 0.99	0.24 0.20	1 10
	<i>C. nigra surinamensis</i>	0.12-0.14	0.54-0.58	0.95-1.03	0.18-0.22	
hopkinsi	<i>S. aurantia</i>	0.17	0.65	1.12	0.30	1

*Parameres measured on only 7 specimens.

TABLE 7.—*Measurements of females in species of Saemundssonia (in mm. except for cephalic index).*

Species	Host	Signature width Mean	Range	Head width Mean	Range	Cephalic index Mean	Range	Sternite VII length at midline Mean	Range	No. Spec- imens
sterna	<i>Sterna h. hirundo</i>	0.17	0.16-0.18	0.64	0.62-0.65	1.00	0.95-1.05	0.10	0.10-0.11	11
	<i>S. d. dongallii</i>	0.16		0.62		0.99		0.09		1
	<i>Gelochelidon nilotica aranea</i>	0.17	0.16-0.18	0.66	0.64-0.68	1.00	0.99-1.02	0.11	0.10-0.11	5
lockleyi	<i>S. paradisaea</i>	0.17	0.17	0.61	0.59-0.62	0.92	0.90-0.95	0.10	0.09-0.10	6
	<i>S. vittata bethunei</i>	0.17	0.17	0.62	0.62	0.97	0.95-0.98	0.10	0.10-0.11	2
melanocephalus	<i>S. a. albifrons</i>	0.14		0.59		0.95		0.11		1
	<i>S. albifrons antillarum</i>	0.13	0.12-0.14	0.56	0.52-0.58	0.96	0.92-1.00	0.10	0.09-0.11	14
parvigenitalis	<i>S. forsteri</i>	0.16	0.14-0.18	0.60	0.58-0.62	0.96	0.93-0.99	0.11	0.10-0.13	9
laticaudata	<i>Thalasseus bergi velox</i>	0.18		0.68		0.96		0.09		1
	<i>T. bergi cristatus</i>	0.16		0.65		1.00		0.08		1
	<i>T. m. maximus</i>	0.18	0.16-0.19	0.68	0.65-0.71	0.98	0.96-1.00	0.09	0.08-0.11	12
brevicornis	<i>T. sandvicensis acuflavidus</i>	0.17	0.15-0.18	0.66	0.63-0.69	0.96	0.94-0.99	0.10	0.08-0.11	10
meridiana	<i>S. anaethetus melanoptera</i>	0.16	0.15-0.17	0.72	0.70-0.75	1.07	1.04-1.09	0.07	0.06-0.08	5
petersi	<i>S. f. fuscata</i>	0.17	0.16-0.18	0.67	0.64-0.70	0.97	0.93-0.99	0.07	0.06-0.08	14
	<i>S. f. crissalis</i>	0.16	0.15-0.16	0.69	0.65-0.71	0.99	0.97-1.01	0.07	0.06-0.08	6
	<i>S. fuscata oahuensis</i>	0.16	0.15-0.16	0.67	0.66-0.67	0.97	0.96-0.97	0.07	0.06-0.07	2

	S. lunata	0.17	0.16-0.18	0.69	0.68-0.71	1.01	0.98-1.03	0.09	0.09-0.10	4
snyderi										
lobaticeps	Chliddonias leucoptera C. nigra surinamensis	0.14 0.15	0.14 0.14-0.16	0.68 0.66	0.68-0.69 0.65-0.68	1.11 1.06	1.09-1.12 1.04-1.07	0.10 0.11	0.09-0.11 0.10-0.11	2 3

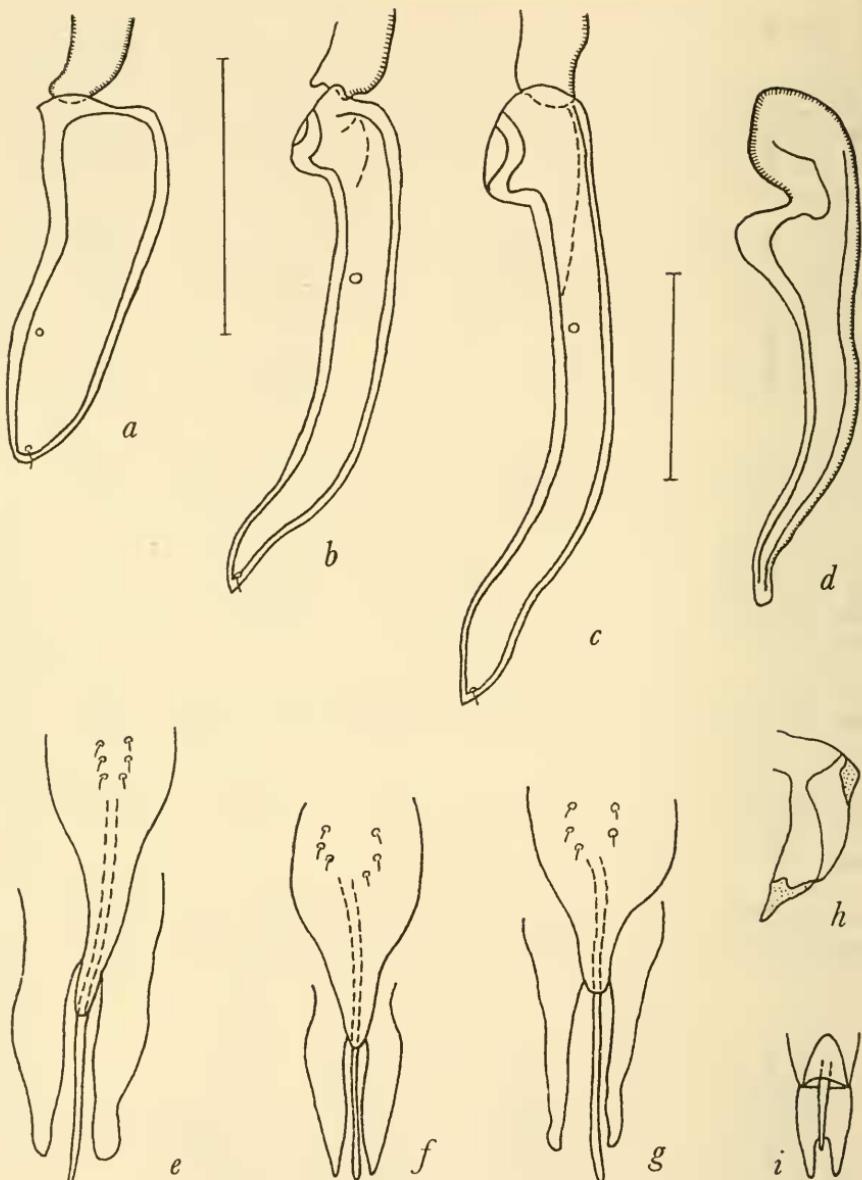


FIGURE 1.—*a*, *Saemundssonia parvigenitalis*, paramere (holotype); *b*, *S. petersi*, paramere (holotype); *c*, *S. snyderi*, paramere (lectotype); *d*, *S. petersi*, endomere (holotype); *e*, *S. meridiana*, mesosome; *f*, *S. petersi*, mesosome (holotype); *g*, *S. snyderi*, mesosome (lectotype); *h*, *S. parvigenitalis*, endomere (holotype); *i*, *S. parvigenitalis*, mesosome (holotype). The vertical line to the right of figure *c* represents 0.10 mm. Figure *b* is drawn to the same scale. The scale of the remaining figures is represented by the line to the right of figure *a* and is also equivalent to 0.10 mm.

Literature cited

BURMEISTER, CARL H. C.
 1838. Handbuch der Entomologie, vol. 2, pp. 418-433.

CLAY, THERESA
 1949. Species of the genus *Saemundssonia* (Mallophaga) from the Sterninae.
 Amer. Mus. Nov., No. 1409, pp. 1-25.

FERRIS, G. F.
 1932. New species and other records of Mallophaga from the Marquesas.
 Bernice P. Bishop Mus. Bull. No. 98, pp. 53-72.

GIEBEL, CHRISTOPH G. A.
 1861. Verzeichniss der von Chr. L. Nitzsch untersuchten Epizoen nach
 den Wohnthieren geordnet. Zeitsch. Ges. Naturwiss., vol. 18,
 pp. 289-312.
 1874. Insecta Epizoa, 308 pp., 20 pls.

KELLOGG, VERNON L.
 1896. New Mallophaga, I, with special reference to a collection made from
 maritime birds of the bay of Monterey, California. Proc. Calif.
 ornia Acad. Sci., ser. 2, vol. 6, pp. 31-168.
 1906. A second collection of Mallophaga from birds of the Galapagos and
 Revillagigedo Islands and neighboring waters. Trans. Amer. Ent.
 Soc., vol. 32, pp. 315-324.

KELLOGG, VERNON L., AND CHAPMAN, B. L.
 1902. Mallophaga from birds of the Pacific coast of North America. Journ.
 New York Ent. Soc., vol. 10, pp. 20-28.

KELLOGG, VERNON L., AND KUWANA, S. I.
 1902. Papers from the Hopkins Stanford Galapagos Expedition 1898-1899.
 Entomological results, 8. Mallophaga from birds. Proc. Wash.
 ington Acad. Sci., vol. 4, pp. 457-499.

KELLOGG, VERNON L., AND PAINE, J. H.
 1910. Mallophaga from birds of Laysan Island. Ent. News, vol. 21, pp.
 124-125.

LINNÉ, CARL
 1758. Systema naturae, ed. 10, vol. 1, pp. 611-614.

NITZSCH, CHRISTIAN L.
 1818. Die Familien und Gattungen der Thierinsekten (Insecta epizoica)
 als Prodromus einer Naturgeschichte derselben. Germar Mag.
 Ent., vol. 3, pp. 261-316.

OLFERS, IGNAZ F. J. M. VON
 1816. De vegetativis et animatis corporibus animatus . . . , pt. 1, pp.
 70-97.

PETERS, H. S.
 1928. Mallophaga from Ohio birds. Ohio Journ. Sci., vol. 28, pp. 215-228.
 1936. A list of external parasites from birds of the eastern part of the
 United States. Bird-Banding, vol. 7, pp. 9-27.

PIAGET, E.

1885. Les Pédiculines, suppl., 200 pp., 17 pls.

PICAGLIA, L.

1885. Pediculini nuovi del Museo di Zoologia ed Anatomia Comparata della R. Universita di Modena. Atti Soc. Italiana Sci. Nat., vol. 28, pp. 82-90.

RUDOW, F.

1869. Beitrag zur Kenntniss der Mallophagen oder Pelzfresser.

THOMPSON, G. B.

1948. Mallophaga collected by the *Tanager* Expedition. Occas. Pap. Bernice P. Bishop Mus., No. 19, pp. 195-200.

TIMMERMANN, G.

1950. *Saemundssonia meridiana* n. sp., eine bemerkenswerte neue Mallophagenart von *Sterna anaethetus* Scopoli. Parasitological News; Reykjavik, Iceland, ser. 1, No. 1, pp. 1-4, 1 fig.

WARD, RONALD A.

1953. Brief Notes on the Mallophaga, I. Ent. News, vol. 64, pp. 201-204.